CLAIMS:

1. A method of segmenting a re-ordering buffer in WCDMA HSDPA system, comprising the steps of:

5 dividing the re-ordering buffer into multiple segments;
dividing each segment into multiple blocks such that blocks within the same segment have the same size while the sizes of blocks located in separate segments are integer multiples of each other.

10 2. A method according to claim 1, wherein the multiple segments include a first, second and third segment.

3. A method according to claim 2, wherein the size of the blocks of the first segment is 2 times that of the second segment, and 4 times that of the third
15 segment.

4. A method according to claim 3, wherein the size of the blocks of the first segment is the maximum length of received TTI data.

20 5. A method according to claim 3, wherein the size of the blocks of the first segment is half of the maximum length of received TTI data.

6. A re-ordering buffer for storing TTI data in WCDMA HSDPA system, comprising multiple segments, wherein each segment is composed of multiple
25 blocks with equal size, and the sizes of the blocks of a first segment of the multiple segments are integer multiples of the sizes of the blocks of additional segments of the multiple segments.

7. A method of mapping TTI data to the re-ordering buffer of claim 6, comprising
30 the steps of:
determining a size category of the TTI data;

comparing the size category of the TTI data with sizes of the blocks of the first segment and the additional segments to find a matching block for storing the TTI data;

storing the TTI data in the matching block if an empty matching block is found, but if no empty matching block is found then:

storing the TTI data in a block with a size larger than the size category of the TTI data;

storing the TTI data in adjacent blocks, if such a block with a larger size is unavailable.

8. A method according to claim 7, wherein the step of determining is based on the size of the TTI data and the sizes of the blocks of the segments.

9. A method according to claim 7, wherein the step of storing the TTI data in a block with a larger size comprises the steps of:

If a larger sized block is partially occupied but still has enough space for the TTI data, storing the data in the block; and

If such a larger sized block is unavailable, storing the TTI data in a free block with a larger size.

10. A method according to claim 7, wherein the step of storing the TTI data in adjacent blocks comprises a step of storing the TTI data in a minimum number of adjacent blocks.